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attacked in precisely the same way at the same time, and the development of the mania leading to suicide was parallel in the two persons. Cases of this sort show a great susceptibility to nervous contagion. Cases of similar dreams in two or more individuals more or less in the same physiological state have been known.

PSYCHOLOGY IN AMERICAN COLLEGES AND UNIVERSITIES.¹

PSYCHOLOGY AT THE UNIVERSITY OF WISCONSIN.

BY PROFESSOR JOSEPH JASTROW.

Courses: (A) General course in Psychology for such students as take no other Philosophical work. Fall term: daily (about 65 hours); largely elementary work by recitation. Prof. *Stearns* has the class half the time, taking general topics in Psychology, and such as have a philosophical bearing. Murray's Handbook of Psychology is used as a basis in this work. My own part of the work is by lectures, covering the following ground: (1) The Senses (following Bernstein's Five Senses of Man), laying stress upon the psychological interpretation of sensations; (2) the Nervous System treated somewhat as in Carpenter's Mental Physiology, ch. II., not in detail and with some comparative and developmental considerations, and laying stress upon reflex, automatic (and secondary automatic), and voluntary acts, as well as on the general discussion of higher and lower centers and localization, (1 and 2 cover about three-fifths of the course); (3) the Psychophysics Law and Experimental Psychology, accentuating the importance of methods and the relations between the senses; (4) Time Relations of Simple Mental Phenomena, simple reaction, distinction, choice, association, etc.; (5) Experiments with Higher Mental Processes, memory, attention, association of ideas, etc.; (6) Animal Psychology (1 lecture); (7) Infant Psychology (1 lecture); (8) Morbid Psychology: diseases of speech, of memory, of will, of personality (Ribot) as illustrating normal Psychology (3 lectures); (9) Anthropological Psychology (1 lecture). Only such experiments and demonstrations are performed as can be shown to a large class at once: the simple phenomena of sensation, with models of sense-organs, simple reaction-time experiments, and the like. The class last autumn numbered ninety-seven.

(B) Advanced Psychology: Lectures two hours weekly, and one afternoon in the laboratory for winter and spring terms; about forty-five lectures and half as many demonstrations in laboratory. Students must have taken course (A) to enter course (B). Ladd is used as a reference book for students. The topics are covered in a very much more thorough manner than in course (A), and in all points in which the same topics occur in the two courses the elementary parts are hastily reviewed and the topics then resumed. As far as practicable each student repeats for himself all experiments and observations. A list of topics in order is as follows: (1) Nervous System, covering the ground in Ladd, sections are examined, models used, and the simpler physiological experiments performed; (2) Senses, with very full tests of experiments, the students making the usual designs for the stereoscope, rotating discs, color experiments, test weights, etc.; (3) Reaction-times as in course (A), but more detailed, and with variety of experiments; (4) Psycho-

¹ It is only fair to state that the accounts given below were for the most part received by the editor two months ago.

physic Law : full experimental treatment; (5) Experiments with Higher Processes. This experimental portion occupies the entire winter term. Topics taken up in the spring term are: (1) Comparative Psychology (attempts will be made to have a few instinct studies going on); (2) Morbid Psychology, including psychic research problems and defectives (visits to neighboring insane asylums are contemplated); (3) Anthropological Psychology (Tyler as basis); (4) Psychological Theories. One afternoon in each week is devoted to the tests above mentioned, to demonstrations or other laboratory exercises. Where the topic does not admit of such illustrations, a lecture or report upon literature will be substituted.

At present the library facilities are inadequate, but my own library is at the disposal of students.

The laboratory consists of one large room on the second floor of Science Hall, and an ante-room for quiet, undisturbed work. It is proposed to fit this also as a dark room. Apparatus is constantly being added. We have in use now the following: Hipp chronoscope with fall apparatus, also long fall apparatus of my own construction; Yung triple rotating apparatus, two full sets color discs, etc., Yung clock-work for rotating discs; Holmgren color-blindness test, Joy-Jeffries color-blindness chart, Oliver test-letter chart, Snellen's Optotypes, apparatus for testing blind-spot (own construction), model of eyes in motion, six stereoscopes, Wheatstone stereoscope, two aesthesiometers (own construction), two muscle sense apparatuses (own construction), apparatus for bilateral asymmetry, two pressure sense apparatuses (our construction), Verdin rotating drum, Marey tambour, Deprez signal, three metronomes (with Marey attachment), Féré dynamometer (with Marey recording attachment), Savart's wheel, color contrast apparatus, psychophysics law apparatus, colored papers, drawing instruments and usual supplies. Many of the instruments of the physiological department, especially models, are used.

Laboratory work: Besides the weekly demonstrations and the repetition of experiments by students, original research is undertaken under my personal guidance. Students meet by appointment and do as much as time allows. I spend three entire afternoons in the laboratory throughout the year. A Fellow in Psychology and Philosophy has been appointed. Private research is engaging several advanced students. The "Studies" which have been printed in this JOURNAL give an idea of this work. An evening Psycho-philosophical Seminary is contemplated. Plan: one-half term to a selected topic discussed throughout the season; other half to literature, mainly that of the periodicals.

PSYCHOLOGY AT THE UNIVERSITY OF NEBRASKA.

By DR. H. K. WOLFE.

In the University of Nebraska the first attempt to introduce the study of Physiological Psychology and Psychophysics was made in the fall of '89. As a preparation for the specific work of the year a course of five general lectures on the following subjects was given: 1, Philosophy; 2, Psychology; 3, Biology; 4, Embryology; 5, Development of the Individual Human Nervous System. Ladd's Physiological Psychology was recommended as a guide, and, except in the succession of topics, represents the work done by the average member of the class. During fourteen weeks about one-half of the text was completed. The subject will be continued one term longer for the general student, and will be followed by special work for those desiring it. References were freely given to THE AMERICAN JOURNAL OF PSYCHOLOGY, *Mind*, *Philosophische Studien*; to Foster, Gray, Balfour, Wundt, Schwalbe, Hermann (Handbuch), *et al*; yet only occasionally was work outside of text book

required of the student. Considerable extra text work was required where Ladd's treatment was deemed too brief, as in reflexes, development, and especially the sense-organs of sight and hearing.

The class room work was informal, having for its object the elucidation of obscure points rather than the discovery of indolence and ignorance in the student. As aids the department has (a) a set of Marshall's charts and numerous home-made drawings (chiefly embryological), besides several hundred painted squares and discs for color sensations; (b) Azoux's Synthetic Preparation of Brain, Eye, and Ear; (c) Hipp's chronoscope; (d) the nucleus of a psychological library. Several pieces of apparatus for original research are in process of construction. Not a few instruments belonging to the departments of Biology and Physics can be used as required.

For the term beginning Jan. 2d there were offered; (a) the continuation of Physiological Psychology; (b) a four hour course in Experimental Psychology; (c) a special course of lectures on Sight. Next year (a) and (b) together with a course on Pedagogical Psychology will extend throughout the year.

Besides assisting in the cultivation of the general student, it is expected that this department will render material aid to scientific pedagogy; furthermore, that its work will have a practical bearing on methods in the public schools of the state. The plan includes, therefore, three more or less distinct objects, viz.: general cultivation, pedagogical foundation, original research. It is intended to equip the laboratory as fast as funds can be obtained. After next year post-graduate work and opportunity for original research will be offered; the lecturer has considerable material on hand, and is now engaged on a subject of apparent fertility.

DEPARTMENT OF PSYCHOLOGY AT THE NEW YORK COLLEGE FOR THE TRAINING OF TEACHERS.

BY W. L. HERVEY.

As the New York College for the Training of Teachers is a professional school where none but professional branches are pursued, Psychology is studied solely as a branch of Pedagogics. Only so much of Philosophy, Physiology and Rational Psychology is introduced as is necessary to enable student-teachers to derive the principles of Pedagogic Science. The data for these fundamental principles are gained partly by reading and lectures but largely by induction by the class from personal experience and from observation of children. At the beginning of the second term of the first year students are given blanks, with definite time and opportunity to study the children and record observations. To aid them further in finding out the contents and workings of children's minds, sets of questions, which suggest ways and means of investigation, are placed in the hands of all. A large Model School in connection with the College affords ample opportunity for profitable work in this direction. The special Kindergarten students are also required to make definite record of all observations in the course of their almost constant intercourse with children. It is thought that this study of children, which has hitherto been largely overlooked, will result in important contributions to educational science.

PSYCHOLOGY AT COLUMBIA COLLEGE.

BY PROFESSOR NICHOLAS MURRAY BUTLER.

Psychology is one of the subjects included in the work of the philosophical chair and up to the present time has not been organized as an independent department. This is a step in advance which it is hoped to take in the near future. Up to the present time no laboratory or

apparatus has been provided for the study of Experimental Psychology, but the present incumbent of the philosophical chair (who has been at the head of the work for but a short time) has already laid the matter before the President and Trustees and hopes to secure within a few months not only a specialist in Experimental Psychology, but a well-arranged laboratory and a fair stock of apparatus. When this has been accomplished, it is the intention to organize a thorough course of three years in Experimental Psychology modeled after the best American and European courses. The first year of this course will be elective for members of the senior class in the college; the two remaining years will belong to the graduate or university work. Of course the laboratory and apparatus will also be available for independent investigation and research by specialists attached either to this or other institutions. Arrangements are also well under way by which the results of any original observations or experiments may be promptly published by the department. It is hoped that this course, when established, will be specially attractive to many of the students in the medical school of the College.

The library facilities are and will continue to be unexcelled. As rapidly as possible the standard psychological works, journals and reports are being collected, and funds will not be wanting to supply any reasonable demand of this kind.

At the present time only the introductory part of the course referred to is being given, and that without any adequate supply of apparatus or illustrative material. The instruction is wholly by lecture and covers the general relations of body and mind, the gross anatomy of the cerebro-spinal system, the anatomy and physiology of the end-organs of sense and of motion, and the simpler problems of cortical localization and of psycho-physics.

PSYCHOLOGY AT HARVARD UNIVERSITY.

BY PROFESSOR WILLIAM JAMES.

The Corporation of Harvard University have recognized the position of Psychology as an independent science, by creating a new professorship bearing its name. Professor *William James* was appointed Professor of Psychology last December; and it is hoped that the department will start next fall with a laboratory amply furnished and endowed, and the beginning of a library for the exclusive use of its students and additional to the University library. These so-called departmental libraries are already in existence in many of the branches of instruction at Harvard. This year the psychological instruction is in the hands of Professors *James* and *Royce*, who each give to the undergraduates a course in Logic and Psychology for three hours a week throughout the year. The Psychology occupies about six of the eight months during which lectures last. Both instructors use Ladd's Physiological Psychology as a text book, and accompany it with comment and experimental demonstration. The subject is decidedly popular with the students, 175 of whom have elected it this year.

The graduate course is given by Professor *James*, this year to six graduates, and to two seniors specially privileged. The method is the so called seminary-method, no two men doing just the same work. Brain-anatomy, however, forms an obligatory part of the course, and human brains are dissected instead of the sheep's brains used by the undergraduates. The class meets two hours weekly at the Professor's house for lecture and discussion, and the students do their laboratory work at special individual hours. This course lasts two years. Two of last year's students attend this year. The papers by Mr. Delabarre in this JOURNAL (Vol. 2, pp. 326, 636) are fruits of last year's work.

PSYCHOLOGY AT YALE UNIVERSITY.

BY PROFESSOR GEORGE TRUMBULL LADD.

Any fairly complete account of the study of Psychology at this University should include the following particulars:—

A. *An Elementary Course.* This course is prescribed for all Juniors in the Academical Department; it covers three hours of class-room work a week during the entire year,—if, as in my opinion is certainly just, we include under the head of Psychology those mental phenomena ordinarily assigned to formal logic, logical praxis, and descriptive ethics. It is taught by Mr. *Duncan*, with the free use of several text-books; and it is designed to open the field before the students, and enable each man intelligently to choose whether he will accept or reject the offers of further work in the subject.

B. *Supplementary and Allied Courses.*—During the same (namely, the Junior) year, and for a year following, several courses in biology may be pursued. These cover the ground of experimental inorganic and organic chemistry, especially of physiological chemistry under Professor *Chittenden*, of human physiology, and of comparative anatomy and histology under Professor *S. I. Smith*. The courses are all conducted with a large amount of laboratory work, demonstrations, illustrative experiments, and lectures. Nearly all the men who take my course in physiological psychology have these courses, four hours a week, for two entire years.

In this connection should be mentioned certain work done in the Sheffield Scientific School and in the Medical School. In the former, Professors *Chittenden* and *Smith*, with the aid of their pupils, are constantly making and publishing researches in physiological chemistry and biology. In the latter, Professor *Thacher's* work in physiology, and the work of Professor *Lee* in histology, are worthy of special mention.

C. *Advanced Courses.*—With a class composed partly of undergraduate and partly of graduate students, I go over the ground covered by my "Elements of Physiological Psychology." This course is two hours a week for an entire year. Part I of the book is supplemented by lectures and demonstrations from charts, a complete set of the Boch-Stéger models, and a small but choice selection of histological preparations. For displaying the preparations I find one of Zeiss' hand-microscopes, with objectives and eye-pieces that enable me to go as high as 250 diameters, exceedingly convenient. In teaching Part II I have to rely upon charts (illustrating optical illusions), machine for mixing color-sensations, etc. I regret to say that Yale has not yet established a separate laboratory for researches in experimental psychology.

Dr. *Porter*, whose work of teaching has for several years lain largely in the line of ethics, offers at present an advanced course in psychology. It is designed to afford the student opportunity to re-examine with a critical spirit some of the questions which have been raised by the earlier study of psychology. I have also a course, two hours each week for the entire year, which takes up the psychological problems anew for discussion from the philosophical point of view. Mr. *Duncan* has a somewhat similar course,—though briefer and with less attention, perhaps, to the philosophical implications.

In Pedagogics, as considered from the point of view of psychology, I have a course, which perhaps should be mentioned in this connection.

I do not think it in place to mention apart several other courses in philosophy, and the history of philosophy, taught by lectures and by "seminary" methods, in which psychological and ethical problems have a prominent part. Nor need there be more than a reference to most of the large amount of work in physics, chemistry, biology, comparative anatomy, histology, anthropology, neurology, etc., which is going on in

the several departments of this University. I will only add that Professor *Hastings* has been making special researches in optics, which are soon to be published; and that Professor *Sumner's* course in anthropology, in which Ratzel's *Völkerkunde*, Lippert's *Kulturgeschichte*, and Ranke's *Der Mensch* are used as text-books, with illustrative lectures and detailed study of special topics, is deservedly popular.

The facilities of the library are on the whole very good, although it does not by any means contain all the past and current works on Empirical Psychology. The great "archives" and quarterlies and reports—anatomical, physiological, biological, etc.—are well looked after; it being the policy of the library to accumulate a collection of such books. Within reasonable limits I can have ordered what I desire. My private library contains a good many of those smaller (but sometimes very valuable) monographs, which a large public library is apt to overlook.

PSYCHOLOGICAL AND ANTHROPOLOGICAL APPARATUS NOW
ACCESSIBLE TO STUDENTS IN WASHINGTON, D. C.,
IN THE OFFICE OF THE SURGEON GENERAL.

Psychological and Physiological Tests. Set of whistles of Galton to test hearing, Cattell's reaction time apparatus, æsthesiometer of Jastrow, kinesiometer of Hall and Donaldson, Jastrow's instruments for measuring muscular sense (Nos. 1 and 2), Salter's dynamometer to test pull, Salter's dynamometer to test squeeze, Galton's apparatus to test swiftness of blow, Galton's test type, Galton's test of estimating squareness, Galton's test for judgment of eye, optometer of Taval, optometer made by Giering & Co., Snellen's phakometer.

Experimental Physiology. Kymograph, Keyt's compound sphygmograph, and four others, Kuhne's "optical" eye.

Instruments to Measure the Living. Wooden rod on standard for stature, etc., Mathieu's anthropometer (Broca's pattern), British weighing and measuring machine (by Casella, London), height scale after Galton, scale for span of arms after Galton, Broca's graduated plank for anthropometry, Broca's directing square for anthropometry, Broca's exploring square for anthropometry, conformateur (as used by hatters), two pair of chest calipers, Kluge's pelvimeter, cephalometer of Antelme.

Instruments for Measuring Skulls. Spengel's craniometer, Virchow's craniometer, Virchow's steel caliper, millimeter wheel, steel measuring tape, caliper of three branches, ordinary caliper, gliding caliper of Broca, Flower's modification of Broca's caliper, steel rulers in inches and centimetres, Topinard's projecting board, Topinard's craniophore, Topinard's large square, Topinard's small square, median facial goniometer, facial goniometer, parietal goniometer of Quatrefages, mandibular goniometer, apparatus (old fashioned) for studying *foramen magnum*, iron craniophore, projecting board for long bones (with goniometer).

Instruments for Drawing Skulls. Drawing apparatus of Lucæ as improved by Spengel with two orthoscopes, apparatus of the Army Medical Museum with three periglyphs, endograph, craniophore for holding crania to be photographed, stereograph of Broca, apparatus to draw axis of ends of humerus to estimate its torsion, instruments to take internal capacity of skulls, bronze standard skull of Ranke.

Set of Instruments and Materials for Shot Measurement. Hunting shot No. 8, shot jar, two-litre measure, two tin pans, two ring-shaped mats, rammer, wadding, one-litre measure, one-litre graduated glass, wooden operculum for the same, funnel (2) small, funnel (5) large, leather jacket for frail skulls, machine to drop shot into the litre can.

Set of Instruments and Materials for Water Measurement. Scales, weights, ether spray apparatus, shellac, adhesive plaster, putty, simple

cerate, lard, linseed oil, bread board, rolling pin, water vessel with tubing and stopcock, half-gallon measure, pan with lip, metronome, 2000 c. c. graduated glass, wiper for the same, insufflator, powdered lycopodium, instruments to remove putty, thermometer; also, for use when required to replace either method, a quantity of mustard seed.

PSYCHOLOGY AT THE UNIVERSITY OF PENNSYLVANIA.

BY PROFESSOR JAMES MCKEEN CATTELL.

Special courses in Psychology are given by Professor *Fullerton* and the writer. Professor *Fullerton* is giving this year two courses, one for undergraduates, the other for graduate students. In these courses special stress is laid on psychological analysis, and those regions of Psychology which border on the theory of knowledge. The writer gives three courses extending through the year; an introductory course in Experimental Psychology, a course beginning with the special study of some psychological problem, and taking up in the second half year Comparative, Social and Abnormal Psychology, and an advanced course in Physiological and Experimental Psychology. These courses include either practical work or research on the part of the student. A lecturer on Philosophy and an assistant in Psychology are about to be appointed, and additional courses will be given next year.

In addition to these special courses, Physiological, Abnormal and Comparative Psychology may be studied in the Medical and Biological departments of the University. These are probably without rival in America, and offer complete courses of lectures, practical work and clinics. Psychology borrows from and lends to all the sciences. Everyone of the large number of advanced courses offered by the University bears some relation to Psychology, and may prove useful to the student. Attention should also be called to the libraries, scientific and art collections, zoölogical and botanical gardens, literary and scientific societies, etc., of Philadelphia. The asylums and hospitals will be found of special advantage to the student of Psychology.

The new library building of the University is nearly completed. There is a special endowment for the purchase of philosophical and psychological books, and any books needed by students for special work will be obtained. The University press is about to begin the issue of a series of monographs, representing work done in the fields of Philosophy and Psychology. The first number, now in press, is a psychological study on "Sameness and Identity," by Professor *Fullerton*. Following this number will be a series of researches from the Laboratory of Psychology, and an edition of Descartes' "Meditations" with Latin and English texts and philosophical commentary.

It is possible that the readers of the AMERICAN JOURNAL OF PSYCHOLOGY may be interested in some details concerning the Laboratory of Psychology, and the researches now in progress. The writer believes that the chief work before Experimental Psychology is the measurement of mental processes. As Experimental Physics is devoted to the measurement of time, space and mass in the material world, so Experimental Psychology may measure time, complexity and intensity in consciousness. In so far as cases are investigated in which one mental magnitude is the function of another, a mental mechanics is developed.

The laboratory possesses apparatus, which measures mental times conveniently and accurately. This apparatus has been described in *Mind* (No. 42), but since then it has been improved. The chronoscope has been altered and a new regulator made, so that the mean variation of the apparatus is now under one-thousandth of a second. New pieces have been built for the production of sound, light, and electric stimuli. Apparatus for measuring the rate of movement and for other purposes

has been added. The observer is placed in a compartment separated from the experimenter and measuring apparatus. With this apparatus researches are being carried out in several directions. Professor *Dolley* is measuring the rate at which the nervous impulse travels, using two different methods. In one series of experiments an electrical stimulus is applied to different parts of the body, and a reaction is made either with the hand or foot. The rate of transmission in the motor and sensory tracts of the spinal cord has thus been determined. In a second series of experiments two stimuli are given at different parts of the body, and the interval between them adjusted until the observer seems to perceive them simultaneously. It is thought that these experiments will throw more light on human physiology than cases in which the nerve (motor only) of a partly dead frog is artificially stimulated. The times are also of interest to Psychology, as they are needed in order to determine purely mental times. Mr. Witmer is measuring the personal difference in reaction-times, and the work will be extended to different mental processes. These times seem to vary with age, sex, nationality, education and occupation, and their study may have practical value as well as theoretic interest. Length of life should be measured by rate of thought. Experiments are also being made on the variation in the reaction-time from hour to hour and day to day. With the co-operation of Dr. Weir Mitchell and other eminent neurologists the alteration in the time of physiological processes in diseases of the nervous system is being studied. It is believed that such tests may be of use in diagnosis. The nervous impulse may be sent through the system in different directions until a relative delay discovers the diseased part. Recovery and progression may be studied by noting the alteration in time.

Owing to the introduction of cerebral surgery and the advances recently made in the treatment of diseases of the nervous system, any method which may make diagnosis more exact deserves careful study. In addition to the time of physiological processes in disease, other tests of loss of sensation, power and intelligence, are made in the laboratory. The following ten tests are recommended; the methods, etc., are described in an article now in press for *Mind*: 1, dynamometer pressure; 2, rate of movement; 3, sensation-areas; 4, pressure causing pain; 5, least noticeable difference in weight; 6, reaction-time for sound; 7, time for naming colors; 8, bisection of a 50 cm. line; 9, judgment of ten seconds time; 10, number of letters remembered on hearing once. These determinations are made not only on those who are suffering from disease, but also on every one who wishes to be tested. It is hoped that the same tests will be made elsewhere, so that the results of a large number of observations may be compared and combined. The undergraduate students in Experimental Psychology undertake a course of laboratory work in which about two hundred tests and measurements are made. It is hoped that when a sufficient mass of data has been secured, it will have some scientific value. In the cases of two of the tests given above, The Rate of Movement and The Pressure Causing Pain, researches are being carried out in the laboratory. By altering the distance and nature of the movement, and the point of the body to which the pressure causing pain is applied, new quantitative results are obtained.

Professor *Fullerton* is carrying on a research to determine the rate at which a simple sensation fades from memory. A stimulus is allowed to work on the sense-organ for one second, and after an interval of one second, a stimulus slightly different in intensity is given for one second, and the least noticeable difference in intensity is determined by the method of right and wrong cases. The interval between the stimuli is then altered, and it is determined how much greater the difference between the stimuli must be in order that it may be noticeable. The

rate of forgetting is thus measured in terms of the stimulus. Intervals varying from one second to three minutes have been used. For these experiments new apparatus was constructed, and it was discovered that when sensations of light are successive and last for one second, the least noticeable difference in intensity is not about one one-hundredth, as is supposed, but much the same as for the other senses under like conditions. Other observations, such as the importance of keeping the time of stimulation constant, the stronger stimulus coming before or after the weaker, the degree of confidence, the personal and daily variation, etc., have made a new investigation of the least noticeable difference in sensation necessary. This is at present in progress, while further work on memory must wait for its completion. Mr. DeBow is in the mean while making experiments determining the time of stimulation giving the greatest accuracy of discrimination.

The rate, extent and force of movement is the subject of a somewhat extended investigation, which will not be completed for some time. The maximum rate of movement has been noticed above. Experiments on the maximum pressure have been published, as also on extent of right and left handed movements. But the least noticeable difference in the rate, extent and force of movement has never been studied in the same way as the least noticeable difference in passive sensation. Yet it would seem to need such study even more, owing to the importance and obscurity of the "sense of effort."

The laboratory possesses apparatus for studying the time, intensity and area of stimulation needed to produce the just noticeable sensation and a given amount of sensation. These mental magnitudes are correlated so that one may be treated as the function of the other. The results of studying the relation of time to intensity have been published in *Brain* (pt. 31), it being found that the time colored light must work on the retina in order that it may be seen, increases in arithmetical progression as the intensity of the light decreases in geometrical progression. The relation of area to intensity and time is now being studied. Other experiments on the relation of intensity, time and area of stimulation, as determined by the length of the reaction-time, and accuracy of discrimination have been begun.

The laboratory has a valuable collection of Koenig's apparatus for the study of hearing and the elements of music, and a spectrophotometer, a perimeter and other pieces for the study of vision. Work on hearing and vision has been begun in several directions, but is at present delayed for lack of workers. Some progress is, however, being made in studying the fusion of sensations of light, the laboratory possessing special apparatus by which colored surfaces of given areas may in any succession work on the retina for given times. Mr. Newbold, who has been helping with the experiments on memory, is about to begin a research on attention, and it is hoped that next year there will be others ready to undertake original work. Among the subjects for which apparatus has been secured, and preliminary study has been made are: the building of complex perceptions, exertion and fatigue, the measurement of contrast, the association of ideas, and subconscious mental processes.

I have written more frankly than is usual concerning researches not yet ready for publication. My wish is to secure co-operation in applying scientific methods to the study of mind. We have at the University of Pennsylvania good collections of apparatus and laboratory facilities, and these we shall gladly place at the disposal of any one prepared to use them. But the chief thing is that the work be done; where it may be done is unimportant.

PSYCHOLOGY AT INDIANA UNIVERSITY.

By PROFESSOR W. L. BRYAN.

As regards the work in Experimental Psychology in Indiana Univer-

sity:—1. When orders now out are filled, we shall have about \$500 worth of apparatus, including Hipp chronoscope, Marey chronograph with the attachments to both for studying reflex and reaction time. 2. I have been left practically free to make a course of study, except that it is expected to cover fairly the field of Philosophy for undergraduates. I have accordingly organized the work (except one term in Ethics), around the Theory of Cognition and Method of Science. The elementary work in Psychology and Logic has this direction. A year's work in the History of Philosophy is chiefly the history of theories of cognition,—viewed as a sociological development. I have only left for undergraduates one-third of the time for Experimental Psychology. I shall study such parts of Physiological Psychology as throw light upon the personal equation in its most specific and in its more general meaning. Post-graduate students, of whom I have several, will of course work altogether in this line. 3. After the elementary work, there is a review of the results of Physiological Psychology,—at present following the line of Ladd, though of course not confined to that. The larger, including the current, literature is constantly accessible, and is brought to the attention of students. They are encouraged to take collateral work in Biology and in Physics.

PSYCHOLOGY AT CLARK UNIVERSITY.

BY DR. E. C. SANFORD.

The work in Psychology and allied topics at Clark University during the past year has embraced the following topics: Anatomy of the Central Nervous System, Experimental Psychology, Anthropology, Criminology, and the History of Philosophy.

In the way of instruction, Prof. *Donaldson* has delivered a weekly lecture on the first topic, giving special prominence to the embryological aspect and to the relation of structure to function, illustrating the lectures with models and diagrams and following each with dissections, demonstration of sections, exhibition of plates, etc., etc., as might best serve the elucidation of the points in hand. He has also for a portion of the year conducted a weekly seminary upon the history and more general aspects of the question of cerebral localization.

The instruction in Experimental Psychology, under Dr. *Sanford*, has consisted of two courses; one a weekly lecture during the first half year on the time relations of mental phenomena, treating the subject rather minutely and with occasional demonstrations; and the other, a course now in progress (weekly) on sight, taking up in a more general way the vision of color and space perception, with more frequent demonstrations.

Dr. *Boas* has delivered two courses, lecturing twice a week; one on the Anthropology of North America (the Eskimo of the north coast, the Pacific coast tribes, those east of the Rocky Mountains), the other on Methods of Anthropological Study. He has also conducted a weekly seminary for several weeks on "Shamanism."

Dr. *MacDonald* has lectured during the latter part of the year on Crime and Modern Theories of the Criminal.

Dr. *Burt* has lectured through the year on the History of Philosophy, at first on Greek Philosophy and afterward on Modern Philosophy before Kant. He has also conducted a seminary in which twelve dialogues of Plato were subjected to a careful and critical reading with special reference to the development of the author's conceptions; later the categories of Aristotle have been taken up.

Dr. *Cook* has also lectured on the Genetic Character of the History of Philosophy from Locke to Kant. The press of other duties has unfortunately prevented the head of the department, Dr. Stanley Hall, from

taking a personal part in the work of instruction. He lead the seminary, however, for a time in the study of Reflex Action and met a number of men for a time in informal conferences.

In the way of original work and research by instructors and students: In the Neurological department, the question of the relation of the growth of a limb to the growth of its nerves and nerve centers has been studied, and progress made with an exhaustive examination of the brain of the celebrated blind deaf mute, Laura Bridgman; experiments have been continued on the effect of stimulation on ganglion cells, a portion of a history of Reflex Action has been written; and histological work has been undertaken on the cerebellum of the cat. In the Psychological department work is under way on the relation of the reaction-time to the muscular character of the response, on the relation of the concept to the simple sensations upon which it rests, and on organic memory in judgments of rhythm and time. The instructor in Anthropology has expended most of his time for research in the working up of data previously collected. Besides this original work the laboratories in each department (and especially in the last) have been used for practical work of a demonstrational character by students who propose to take up research work at a later period or whose lines of immediate interest were in other but related branches.

It is the desire of the University to provide all necessary facilities for research, and the laboratories have been furnished with that in view. The Neurological laboratory consists of two rooms, one large and one small, supplied with the reagents, apparatus and conveniences for histological and neurological work. In the way of illustrative material the laboratory has Æby's and Azoux's models of the brain in man and Ziegler's of the brain in lower animals, and a set of serial sections through the human brain is now in the making. The psychological laboratory (one large and two small rooms) is especially strong in apparatus for time measurements and psychological optics, having already or in construction most of the standard instruments of Wundt, besides many others of Donders, Snellen, Hering, Holmgren, Bowditch, *et al.* For the study of other chapters of Experimental Psychology a considerable collection of apparatus has been made and will be added to from time to time. The anthropological laboratory (two rooms) has all the essential instruments for anthropometry and craniometry. The library collection of books on all these subjects is carefully selected; all the important current periodical literature is accessible.

Next year the lectures in Neurology will continue upon the central nervous system and sense organs, though the scope and character of the course will be dictated in large measure by the wants of those that attend it. The lectures in Experimental Psychology will treat first the senses of hearing, taste, smell and touch, afterward the psychophysical law, memory, attention, etc. Those in Anthropology will cover methods, especially craniometry, the anthropology of Africa, and American myths. Work will also be continued in the history of philosophy, under Dr. C. A. Strong, though its precise character is not yet certain. Dr. Stanley Hall with the assistance of Dr. W. H. Burnham will conduct a course in Modern Aspects of Education.

PSYCHOLOGY AT THE UNIVERSITY OF TORONTO.

BY PROFESSOR J. MARK BALDWIN.

The students' work in Psychology here has been hitherto general and theoretical. The new curriculum, however, as now ratified by the University Senate, provides for more special and advanced courses and opportunity for research. The recent fire in University College postponed the equipment of the psychological laboratory which the writer had in view, but in the plans for the new buildings more ample accommodations are secured. The new laboratory is to be in the restored

building in a retired portion of the first floor immediately over the rooms of the physical department. It will comprise two communicating working rooms, each 16 by 21 feet, a professor's private room, to be used also as a special psychological library under charge of a fellow or instructor, and a dark room available from the resources of the physical laboratory. The first two rooms will be separated by a hall from the latter two. This part of the building will be ready for occupation, it is hoped, in the course of the next academic year. The equipment, apparatus, etc., may be delayed in consequence of the present severe tax upon the resources of the University, but special researches will be prosecuted with the aid of adapted apparatus kindly loaned from the very complete collections of the departments of Physics and Biology.

The courses in Psychology for next year are: (a) Pass course in General Psychology on the basis of the writer's Handbook of Psychology and Sully's Outlines, two to three hours a week throughout the year. (b) Honor course in Historical Psychology and Theory of Knowledge. (c) Honor course in Experimental Psychology; first, theoretical, based upon Ribot's German Psychology and Ladd; and second, practical, involving laboratory work as soon as the laboratory is ready for occupation. All students in this course will be required to become familiar with the methods and simplest problems of Physiological Psychology, and questions for advanced study and research will be set for students who show the proper aptitude. (d) A course in the Physiology and Histology of the nervous system with special reference to Localization and Mental Disease is to be offered by Prof. Ramsey Wright, of the Biological School. This course serves as preparation for course (c) and for original work on advanced topics. (e) Seminary for reports and discussions of actual researches in hand—meeting weekly. The design is to encourage serious endeavor and stimulate interest in the outlying questions of the sciences, principally among post-graduates. Private facilities will be given whenever possible for experiments in Psychometry and Psychophysics. Of the under-graduates only honor men of the fourth (senior) year will be admitted. It is hoped that the work may be expanded to include problems in Medical and Abnormal Psychology, since the city and provincial institutions present abundant facilities, but nothing in this line has been projected as yet.

During the past year the students of the department have formed a "Psychological Society" for discussion and presentation of papers, conducted entirely by themselves. The object of the society is breadth of information rather than new work. They treat psychological questions, however, quite apart from speculative philosophy.

The library was totally destroyed by the fire, but the new collection is growing rapidly, especially in this department, owing to the notable generosity of friends at home and abroad. In another year it will probably be more complete in psychological publications than before. We are under especial obligations to the editors of *Mind*, *Journal of Speculative Philosophy*, and the AMERICAN JOURNAL OF PSYCHOLOGY for back sets of their respective journals. The new library building as now contemplated is to provide seminary rooms for several of the University departments, one of which (the philosophical seminary room), is to be added to the laboratory rooms mentioned above.

The teaching force is at present the writer and a fellow. After next year Prof. J. G. Hume is to assume his duties, and a post-graduate scholarship in Philosophy is to be established in memory of the late Prof. Young. Thus four at least will be the official force in charge.

The following are the subjects of researches now in progress: "Beginnings of Voluntary Movement in Childhood," "Sense of Effort," "Recognition"—together with special topics for the writer's proposed volume on "Feeling and Will."